

**Excerpt from *Sport Mechanics for Coaches,
3rd Edition***

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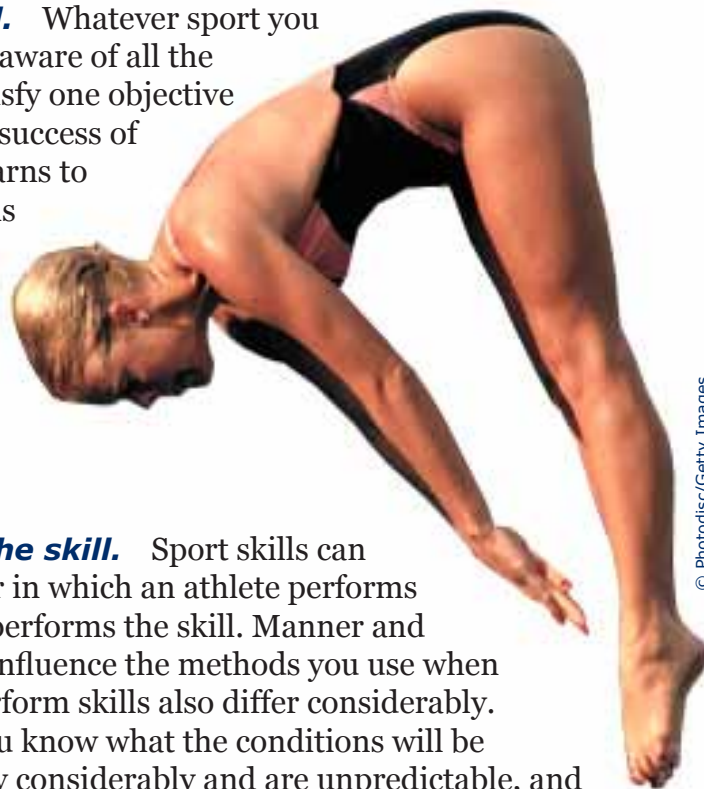
ANALYZING SPORT SKILLS

One of the greatest challenges you'll face as a coach is watching your athlete perform and deciding which aspect of the skill needs correction. Once you have analyzed the performance, you need to communicate this information to the athlete. Collecting objective data (video images, measurements of performance, etc.) will allow you as the coach or sport scientist to provide the "evidence" that can help convince the athlete of any possible correction in technique—which, after all, is what coaching is all about.

If you don't have a well-planned approach, you're likely to be overwhelmed by the complexity and speed of the skill you are trying to analyze. You won't know what aspect of the skill to look at or what error to correct first. In fact, you may see so many errors at once that you throw your hands up in the air and in desperation give vague coaching tips such as "Hit harder" or "Be more aggressive!" Advice like this is of little assistance to your athlete because different people understand different cues. Any advice that is provided must be clear and to the point so the athlete will understand exactly what is required.

What you need to do is gather background information about the skill before you start, and come to each coaching session with a precise plan to guide your observation, your analysis, and your correction of errors. If you understand the mechanics of the skill your athlete is performing and you know how to go after major errors, your athlete benefits immensely and quickly improves in performance. The following steps provide the information you need before you start correcting errors:

Step 1: Determine the objectives of the skill. Whatever sport you coach, whether it is an individual or team sport, be aware of all the objectives required of each skill. If you coach to satisfy one objective and forget or deemphasize another, you'll limit the success of your athlete. What use is it if a water polo player learns to fire the ball at phenomenal velocity if no emphasis is placed on controlling and directing the path of the ball? Similarly, what use is it if you teach a diver how to get great height and spin if the entry into the water is a disaster? So be aware of all the objectives required by a skill, and remember that all these objectives play a part in determining the technique that you teach your athlete.



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Step 2: Note any special characteristics of the skill. Sport skills can be divided into different types based on the manner in which an athlete performs the skill and the conditions under which he or she performs the skill. Manner and conditions are interrelated, and both dramatically influence the methods you use when you coach. The conditions under which athletes perform skills also differ considerably. Some conditions are controlled and predictable; you know what the conditions will be before the competition starts. Other conditions vary considerably and are unpredictable, and it's difficult to know what they'll be when the competition begins. Consider whether a skill is nonrepetitive or repetitive and if it occurs in predictable or unpredictable environments before choosing your method of teaching.

Step 3: Study top-flight performances of the skill. Watching elite athletes perform is an activity that you and your young athletes can do at any time. It's certainly worthwhile to watch the best perform the skill or event that you are coaching. For example, when you watch top-class athletes perform a skill, you get a picture of the speed, rhythm, power, body positions, and other characteristics that make up a quality performance.

This helps you understand the basic movement patterns in the skill you intend to coach.

Step 4: Divide the skill into phases. Your next task is to divide the skill you're interested in coaching into phases. Most skills consist of several phases. A phase is a connected group of movements that appear to stand on their own and that your athlete joins together in the performance of the total skill. Many skills can be broken down into the following four phases: preparatory movements, windup, force-producing movements, and follow-through. This process is important because it makes your job much easier when you look for errors in your athlete's performance. Quite simply, it stops you from becoming confused by trying to watch too much of the skill at the same time.

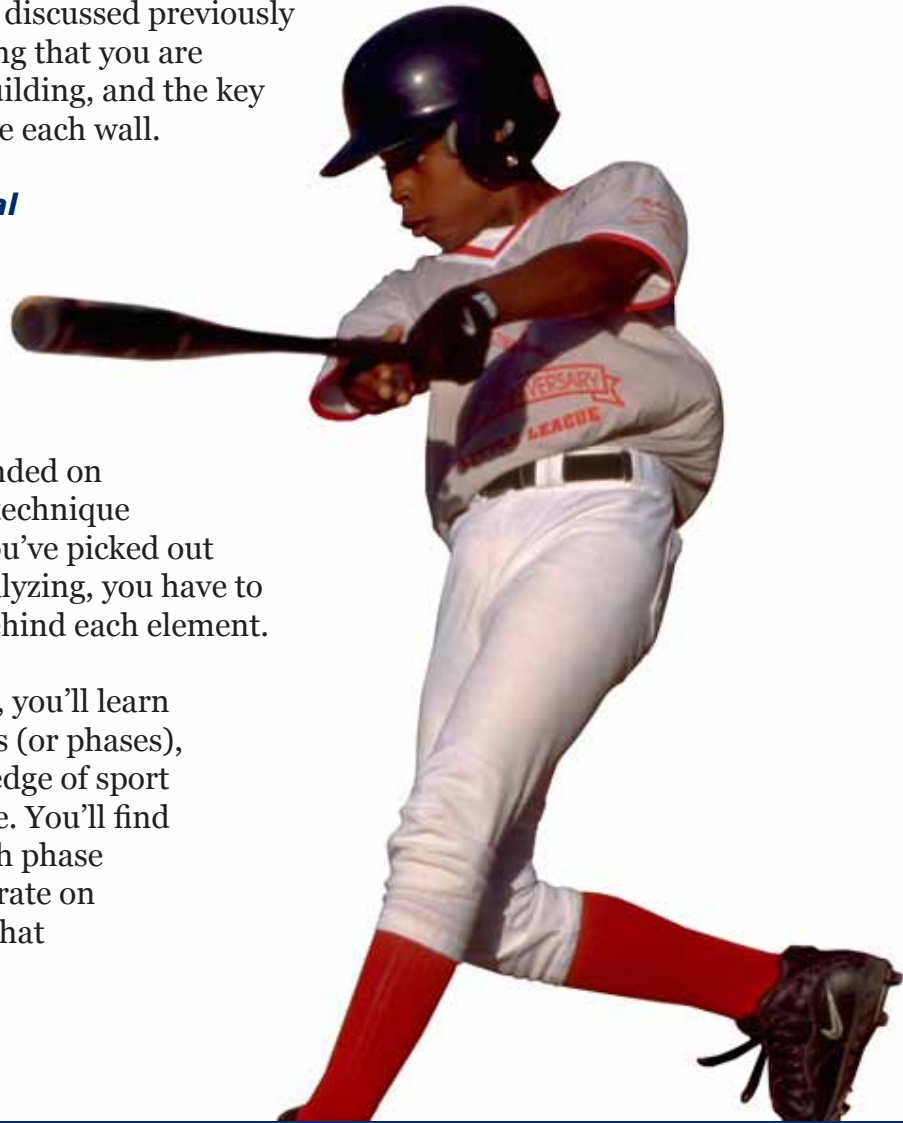


Step 5: Divide each phase into key elements. When you have chosen the most important phases of a skill, direct your attention toward the task of dividing each phase into its key objectives. Key objectives are distinct actions that join to make up a phase (as discussed previously in Step 4). Try to view a skill as a building that you are erecting. Phases are the walls of your building, and the key objectives are the bricks you use to make each wall.

Step 6: Understand the mechanical reasons each key element is performed as it

is. Understanding the mechanical basis behind each key element is a tremendously important step in your sequence. All fundamental actions an athlete makes within technique are founded on mechanical principles. In other words, technique is based on mechanical laws. So once you've picked out the key elements in the skill you are analyzing, you have to understand the mechanical purposes behind each element.

If you work your way through each step, you'll learn how to break a skill into important parts (or phases), and you'll know how to use your knowledge of sport mechanics when you analyze each phase. You'll find out how much easier it is to analyze each phase of a skill separately rather than concentrate on the total skill and then try to recollect what happened.



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About the Author

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OBJECTIVE
DATA

MAKE ADVICE
CLEAR AND
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Brendan Burkett is an associate professor at the University of the Sunshine Coast in Queensland, Australia. He received his undergraduate and master's degrees in engineering and attained his doctorate in biomechanics from the Australian Institute of Sport. Burkett's specializations are teaching biomechanics, sports coaching, and performance enhancement. His research revolves around technology developments in human health and performance. Burkett has written more than 30 peer-reviewed articles and 180 conference publications for journals in sport science, biomechanics, and coaching.

As an international elite athlete, Burkett represented Australia for 13 years as a swimmer and was the Paralympic champion, world champion, world-record holder, and multiple medalist in the Commonwealth Games and Australian national championships. He served as the Australian team captain for the 1996 Atlanta Paralympic Games and as the flag bearer for the Opening Ceremonies of the Sydney 2000 Olympics. Burkett served as the national sport science coordinator for the Australian Paralympic team for the 2002 and 2006 World Championships and the 2004 Paralympic Games. He also worked with the Australian swimming team in preparation for the 2008 Beijing Olympics.

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